

# Surface Matters

What Arizonans are doing with geospatial technology



Newsletter of the Arizona Geographic Information Council

## TOPOFF 4: Arizona's Part in National Terrorist Response Exercise

Last October, specifically the 15<sup>th</sup>–19<sup>th</sup>, the U.S. Department of Homeland Security (DHS) conducted TOPOFF 4, its fourth and most recent large-scale terrorism response exercise.

As explained on the DHS web site, "The U.S. Department of Homeland Security's Top Officials(TOPOFF) Exercise is a Congressionally-mandated two-year cycle of seminars, planning events, and exercises designed to strengthen the nation's capacity to prevent, prepare for, respond to, and recover from large-scale terrorist attacks. The cycle culminates in a full-scale exercise that simulates a coordinated terrorist attack involving weapons of mass destruction (WMD)."

The first TOPOFF exercise took place in May of 2000 and involved 6,500 people at all levels of government. Each successive exercise has been more complex and involved more people. This fourth scenario required 15,000 participants in the United States, the U.S. territory of Guam, and the governments of Canada, Great Britain and Australia.

In the exercise, terrorists were to have detonated a bomb (a "radiological dispersive device") that spreads radioactive material over a wide area in Guam. In the following hours other terrorists were to detonate similar bombs in Portland, Oregon and Phoenix, Arizona.

The scenario in Arizona had the terrorists detonate the bomb in their car while on the freeway ramp heading from Highway 101 north to Highway 202 east. In this area the communities of Tempe, Mesa, Scottsdale, and the Salt River Indian Reservation come

together. The cloud of radioactive dust from the explosion was to have spread southeast into Mesa, forming a plume three miles long.

An exercise of this magnitude requires participants in a great range of fields, including geospatial experts. Brief looks at how different offices used spatial data are presented here to show how GIS specialists contributed to the effort.

Timothy Tait of ADOT says, "The **Arizona Department of Transportation** participated in TOPOFF4 as it would in any actual state emergency. ADOT staff monitored the situation, coordinated with law enforcement and emergency responders, and provided services and information to residents who needed to identify alternative transportation routes.

"ADOT only received data from the State EOC [Emergency Operations Center], and it was more in the nature of situational reports and incident updates. Examples of data included the number of community members requiring evacuation, impacts to pets, hospital closures, fire department resources allocated, and fatality counts.

"ADOT did participate in the development of maps to illustrate the simulated blast location."

From the **Arizona Department of Health Services**, Wesley Korteum explains, "I created maps and tables of all facilities licensed by ADHS (hospitals, nursing homes, day care and other health facilities) that were within the bomb's plume and those within the evacuation area.

*continued on page 2*



### INSIDE THIS ISSUE

3	Career Fest Review
3	Career Fest Responses
5	Newsletter Circulation
6	AGIC Roundup, Calendar of Events

## TOPOFF 4

continued from page 1

"We received an image of the plume area from the Arizona Radiation Regulatory Agency and we received an image of the evacuation area from Maricopa County.

"I had issues with getting data on the plume and evacuation area. I requested the shapefiles for both areas but when they never came I had to georeference the images in order to obtain the spatial data needed."

At the **Maricopa County Department of Emergency Management** (DEM), Marcos Coria "provided core staffing and operation of the Maricopa County Emergency Operations Center during the exercise. The [EOC] serves as the single point of contact for county support to county agencies as well as municipalities located within the county."

As the GIS/WebEOC specialist, Mr. Coria displays geographic information in the EOC and serves geospatial data to outside users over the Internet. He also provides support to the agencies represented in the EOC and to his Internet customers, who are typically other GIS professionals in other emergency operations centers.

At the local level, the **City of Phoenix** had three GIS experts taking part, supporting both the city's Emergency Operations Center and the Tactical Operations Center. They provided county-wide base data (parcels, centerlines, orthophotos, etc.), produced custom maps for Police and Fire, and estimated the contamination plume using the Consequences Assessment Tool Set (CATS) software.

A problem arose with the CATS program. Phoenix uses ArcGIS 9.2, but their CATS software only supports 9.1. They had to switch to the 9.1 version of ArcGIS,

but that gave them difficulties accessing data from their ArcSDE 9.2 database. Somehow they worked their way through it.

Meanwhile at the **City of Tempe**, GIS personnel were operating the map station at the Tempe EOC. Writes Engineering GIS chief Mike Gatewood, "The map station provides maps and other spatial or database content to the EOC staff. In most cases, the technician at the map station keeps maps of the incident and, in our case, projects it on a large screen for EOC staff. In other cases, the map technician retrieves related data for EOC staff requests, such as the location of fire hydrants or other utilities, overview or aerial maps of the site, and other critical map content."

"We would receive some 'event' content from the Department of Homeland Security, typically in the form of faxes and bulletins. ...No content was provided in a consumable GIS format, i.e. ESRI files, DXF files, etc. In nearly all cases, all mapping content was provided as PDF files."

Like Phoenix, some problems arose at Tempe. "We were using new software to manage the EOC activities, and getting used to the software while dealing with the incident was a bit awkward. In some cases, we fell back to the previous manual system for certain items."

As with the previous TOPOFF exercises, the results from this one will be compiled and reports will eventually be released to the public, but that may take several years. It will be interesting to learn the extent to which GIS contributed to the effort. ♦

*See page 6 for links to detailed information about the TOPOFF exercises.*

### **AGIC Board Contacts**

#### **President**

Tom Sturm  
650-329-4326  
tsturm@usgs.gov

#### **Vice President**

Tim Smothers  
623-773-7671  
timothy.smothers@peoriaaz.gov

#### **Newsletter Editor**

Jim Riedmann  
623-773-7392  
agicnews@yahoo.com

*Previous issues of Surface Matters are available on the AGIC web site.*

Mention of private companies in this newsletter is for information only and does not imply endorsement by AGIC or the State of Arizona.

***Surface Matters*** is the quarterly newsletter of the Arizona Geographic Information Council. It is written for those who want to stay in touch with the vision and activities of AGIC and with the continuing growth of GIS in Arizona.

Your comments about this publication are always welcome. Please send all correspondence to the editor.

Readers are invited to submit articles that they wish to be considered for publication. The author retains all copyrights. Please let the editor know if the article has been published elsewhere.

#### ***Arizona Geographic Information Council***

1616 West Adams Street  
Phoenix, Arizona 85007  
Phone: 602-542-4060  
agic@land.az.gov  
**http://agic.az.gov**

---

## GIS Career Fest 2007

The second annual ASU/AGIC GIS Career Fest was a rousing success in bringing together students and employers to discuss the use of GIS in the real world. Students got a sampling of how geospatial technology is used in the workplace and received advice about what they should be learning before graduating.

The Fest took place in the main ballroom of the Memorial Union at ASU. As with last year's event, a panel of four professionals answered questions from a moderator for 30 minutes. Afterwards, students were able to talk with 18 employers who were at tables around the perimeter of the room.

The panelists were Karen Thomas from the City of Maricopa, Stephanie Routh from Dewberry, Denise Price from the Ak-Chin Indian Community, and Jeremiah Lindemann from ESRI. They responded to questions about the types of GIS positions that exist at their organizations, the general skills that are desired to fill those positions, the skills that job candidates seem to lack, and whether a Master's degree or GIS certification makes a difference.

Some general points became clear from the panelists' answers. Positions at many levels, from intern to highly experienced, are available in the job market, but naturally it differs from one employer to another. Employers want people who have more than just GIS knowledge; that is, a degree in some particular field, plus GIS skills, is the combination that employers seek. Regarding the general skills desired, the panelists mentioned personal attributes rather than technical knowledge: the ability to look toward the end result of a project, to understand the steps needed to get there, to work toward specific goals, to learn on the job, to think critically and to communicate well. Of particular interest is the list of skills that job candidates seemed to lack: being able to think through a work flow, problem solving, understanding why a particular procedure should be used, and knowledge of terminology and applications. A question was asked about whether a Master's degree or a GIS certificate made a difference to employers. The answers were mixed. For some, skill level and experience mattered most. In other cases, a higher degree or certificate would probably not make a difference for entry-level positions, but they would for higher positions. Yet another response was that they could make the difference in getting an interview.

Students and employers generally found the Career Fest to be a positive and worthwhile event. The fact that it was a "knowledge fair" rather than a job fair made a big difference. Responses from both students and employers begin in the next column. ♦

## Career Fest Responses

Students and employers were given questionnaires about their impressions of the Career Fest and asked to send their replies to *Surface Matters*. Many were received. Excerpts are given below.

### From Students

- **What point(s) in the panel discussion made the strongest impression on you?**

GIS implementation is enormous. More GIS professionals as well as interns are needed to fill the positions of GIS technician, programmers and others.

*I was impressed with all the different knowledge that is required from not just GIS but computer programming and just a little bit of everything.*

The point that made the biggest impact on me was that, while knowledge of GIS is important, you need knowledge in another supporting area that isn't GIS.

*Internships and experience are the most important factors when being considered for a GIS position.*

*Having a GIS certificate or an advanced GIS degree is less important than having some level of experience when applying for an entry-level position.*

GIS employers are not interested in hiring someone who simply knows how to use the software. It is important to understand why you have chosen to apply the software in a specific manner in order to solve a particular problem.

*I felt that the discussion on what to expect in a job interview had the biggest impression on me. It was great to know what to expect in the future when I actually apply for a job in the GIS industry.*

Repeated emphasis on how important critical thinking, communication, effective writing, and simple programs such as MS Office, gave me the impression that a lot of the candidates going into the GIS field as either interns or entry-level candidates are either sorely under qualified or lacking a basic introduction to computer technologies.

- **What did you learn from the exhibitors?**

Be passionate about what you are doing.

*The exhibitors were helpful in disclosing many of the skills and attributes they look for in possible candidates for employment, as well as providing information regarding future internship and job opportunities. I also learned how necessary skills can differ in relation to the GIS agency/organization.*

I learned about the different ways to use GIS in practice and about the opportunities of different GIS careers. The most important thing I learned is that everybody seems to be interested in hiring students for internships.

*I learned that there are many different areas within a corporation that do not just require the knowledge of GIS. What was also something new to me were the many unique types of corporations where GIS may be used such as engineering, I found all of the information provided very interesting and useful.*

The exhibitors reiterated the comments of the panelists by stressing the importance of gaining

*continued on page 4*

---

## Career Fest Responses

*continued from page 3*

experience through an internship. Several of the exhibitors stated that an applicant's educational background (in terms of their specific field of study) isn't the most important factor when being considered for a position.

*That there is a small but industrious niche for archaeologists with a GIS background.*

- **What other thoughts or impressions did you have about the event or about GIS?**

I personally found the Career Fest to be a very helpful and useful tool that is great for anyone considering a career in GIS. It offers a realistic and real view of what GIS is and how it is used in the professional world, which is not easily found in a classroom. It also allows students an opportunity to jumpstart their careers while still in college, setting the stage for success. I would strongly recommend the Career Fest to anyone considering a career or taking classes in GIS or geography.

*It seemed to be a vital event for us students as we can come in contact with people directly from a company. Every person I talked to kindly provided a lot of information about what they or their company exactly do and need.*

The fact that there even was a Career Fest held only for GIS positions proved that there is a demand for GIS professionals, and that there are many possible jobs.

*It was definitely very informative and it was great to know more about the types of careers in GIS, and what the interview process is like. I liked that I learned even more than I did last year at the GIS Career Fest.*

The event was an overall positive and educational experience that I feel fortunate to have attended.

*I am really glad I attended. I think it helped me with my confidence and was very helpful. One criticism I had was that the panel seemed to talk to the audience of college students like this would be their very first job, naive and young. Maybe this is a proper representation of those graduating and being interviewed. However, I don't feel I exactly fit in this category and as I looked around at the audience there seemed to be a much more mature audience that willfully attended.*

### **From Employers**

- **In talking with students, what did you find most encouraging or discouraging?**

Encouraging: (1) People took the time to show up and hopefully understood some of the points being made prior to their graduation and (2) ASU is including analytical GIS components in their training.

Discouraging: People tended to want to leave their resume and move on rather than try to understand what each individual organization was looking for. The majority of questions I got before any others was whether we have intern openings.

*It was encouraging that so many asked intelligent questions about what they could do to improve their*

*skills, or make themselves more marketable. So many seem willing to go the extra mile, and do more than just the class work required for a degree. As an employer, this is a quality that I always look for during an interview – that level of self-motivation and initiative is what puts a potential candidate over the top because it carries through into their daily work. It's great that they are learning what it really takes to get the job you want. I know I didn't understand this when I was their age and finishing college.*

I spoke with only a few students, but they left me with the impression they were very mature, and had a good focus on what they wanted to do in their careers.

*I was encouraged to hear that many of the students were working on a second degree in Geography or perusing a GIS masters. This means they already have some knowledge and know what their real interests are. I feel that a person working in the GIS field has to be a "Jack of many trades". They need to have the ability to relate to many disciplines so it was nice to see these folks have already had careers or have significant education.*

I found it encouraging that students realize the importance of participating in an internship to gain skills and get to know the GIS community.

- **What particular subjects, if any, would you like to see included in college curricula?**

Keep the analytical thought and practical problems coming. Also, statistics and programming are becoming more important for the analytical needs.

*Any type of class that gives students a chance to apply their new technical skills to real-world problem solving is necessary to develop critical thinking skills. Internships are great for this hands-on experience if you can't get it in the classroom. If I hire an analyst, I expect to be able to present them with a project or task, and ask them to develop an approach for analysis/modeling.*

Not too familiar with the curricula, but would like to see more programming classes related to GIS.

*GIS is a very broad area of study offering a wide variety of career paths, and it would be difficult to provide a cookie-cutter approach to the curricula. I think one panelist offered the view that a GIS student could specialize in a single advanced area of GIS, or study more generalized GIS to complement another professional focus – demographics, transportation, natural resources, etc. I think it's important to get this message out to the students early so they can choose an appropriate path. No one can do it all and some choices will need to be made along the way.*

I believe all students of GIS at any level should have a remote sensing course and make sure they understand what and how this data source is used to gain an understanding of its limitations and uses. I also believe students should have a basic course in project management because as GIS professionals we juggle many tasks to achieve the end result and knowing how to organize ourselves, employees and

*continued on page 5*



## Career Fest Responses

continued from page 4

all resources is vitally important.

- **What other thoughts or impressions did you have about the Career Fest?**

I think it's a great GIS event that should continue for both students and potential employers. In the past, I have attended engineering career fairs as a representative of my company, but GIS professionals and students don't usually show up at those, so it was always difficult to locate potential hires. General career fairs are so large and non-specific that they are also not the best venue to match up the right candidates with an employer. I'd like to see more universities offer a specific GIS Career Fest.

*I think it was a great event and AGIC should consider incorporating other Universities and colleges – or investigate separate events at other schools. We're definitely looking forward to participating again next year. Good Job.*

This is a great event and I wish this kind of thing had been around when I was an undergraduate.

*Just to keep up the great work and to keep passing along great information like this to students and potential employees.*

I was pleased to see the various vendors and possible employers take time to come out, set up tables and discuss GIS issues with the students and faculty. ♦

## Contributors

**Kevin Blake**, Yavapai County MIS  
GIS Coordinator

**Jeff Boyd**, Arizona Dept. of Transportation  
Transportation Engineering Specialist

**Glen Buettner**, Arizona Forestry Division  
GIS Manager

**Marcos Coria**, Maricopa County Dept. of Emergency  
Management  
GIS Programmer/Analyst

**Tom Elder**, City of Phoenix  
GIS Database Analyst

**Santiago Garcia**, City of Peoria  
Senior GIS Analyst

**Michael Gatewood**, City of Tempe  
Engineering GIS Supervisor

**Jason Howard**, Maricopa Association of Governments  
GIS and Socioeconomic Program Manager

**Wesley Kortuem**, Arizona Dept. of Health Services  
GIS Coordinator

**Brian Sovik**, AMEC Earth and Environmental, Inc.  
GIS Manager

## Newsletter Gets Around

*Oh where, oh where has the newsletter gone?*

*Oh where, oh where can it be?*

As a matter of fact, it's all over the place! *Surface Matters*, your quarterly herald of Arizona's GIS activities, is passed around through cyberspace to the far corners of Arizona and beyond.

Because this newsletter is distributed as a PDF file through the Internet, there's no way of tracking how far it goes or who gets it. Its only official distribution is through the AGIC listserv, which currently has just over 300 subscribers. Once it goes out on AGIC-L, what happens next?

Many of the recipients of *Surface Matters* find it worthy enough to pass along to their colleagues. In some cases it goes to other GIS listservs, in others it goes to the GIS staff in government offices and private companies, and in further instances it's passed to students by teachers. It is forwarded, for example, to

- Northern Arizona GIS User Group
- Tucson Area GIS Cooperative
- ASUGIS student listserv
- Students at Phoenix College
- Pima GIS Yahoo Group
- Arizona Professional Land Surveyors

It is also sent to the members of the New Mexico Geographic Information Council, so let's extend a big hello to our friends in New Mexico!

A fair amount of cross-pollination occurs between the various listservs and user groups; many people receive multiple copies. As a rough estimate, however, it appears that each issue of *Surface Matters* finds its way to something on the order of 800-1000 people. Not bad for a humble little newsletter! ♦

**Timothy Tait**, Arizona Dept. of Transportation  
Community Relations Director

**Karen Thomas**, City of Maricopa  
GIS Manager

**Karen Wigglesworth**, HDR Inc.  
GIS Manager / Southwest Regional GIS Coordinator

The following students, all from ASU, kindly contributed their thoughts about the Career Fest.

**Erinne Blakeman**  
**Ausrine Kelbauskiene**  
**Eric Kent**  
**Jamie Marin**  
**Raiza Negrón**  
**Ben Pearson**

**Thomas Peiffer**  
**Joseph Plotz**  
**Beth Roberts**  
**Meagan Rubel**  
**Johannes Zech**



## AGIC Roundup

- The Data Resources Committee and the Technology Committee have agreed to merge. The new body will be called the Data Committee. It will focus on providing applications for public use and data for public consumption. The Arizona Geospatial Clearinghouse, an AGIC initiative that's currently in progress, is a prime example of what the new committee will be working on.
- The first base station of the Arizona Height Modernization Project has been established in Safford. Work on the second station, to be located in Page, is underway. Seven additional stations are currently planned to be established throughout the state.
- AGIC President-Elect Tim Smothers attended the 8<sup>th</sup> annual Yuma Area GIS Users Forum on November 15<sup>th</sup>. It was well attended by professionals from the region. Mr. Smothers addressed the forum, giving an overview of AGIC and discussing how members of the Yuma group can be active in AGIC initiatives.
- The Administrative and Legal Committee will be tackling several projects over the coming year. It has reviewed the original executive order that established AGIC in the late '80s and made recommendations for revisions to keep it current. It is working on the AGIC Work Plan and the AGIC Strategic Plan, and has made recommendations for updates to the AGIC Bylaws. Finally, members of the committee continue to represent AGIC in the Arizona Professional Land Surveyors organization, and are specifically working with the APLS Geospatial Committee.
- AGIC Board member Adam Iten and Outreach Committee Chairman Glen Buettner, on behalf of AGIC, attended the Southeastern Arizona Geospatial Association (SAGA) meeting on December 6<sup>th</sup>. They gave an AGIC overview presentation and fielded questions regarding membership and current activities. SAGA is made up of geospatial professionals from Greenlee, Graham, and Cochise counties.



## Calendar of Events

### TUCSON GIS COOPERATIVE

JANUARY 15, 2008

3:00 PM - 4:30 PM

CITY INFORMATION TECHNOLOGY DEPT. - PUEBLO ROOM

481 W. PASEO REDONDO, TUCSON

[WWW.TUCSONAZ.GOV/GIS](http://WWW.TUCSONAZ.GOV/GIS)

### WESTERN UNITED STATES MANIFOLD USERS CONFERENCE

JANUARY 18-19, 2008

MESA

4700 EAST SOUTHERN AVENUE, MESA

Presentations will cover various topics of interest, including:

GPS Integration

Programming with the Manifold ActiveX Control

Database Implementation

Migrating from ESRI to Manifold

Linked Drawings

Project Demonstrations

Registration fee is \$50 for both days, \$25 for one day.

[www.gis4everyone.com/WUSMUC](http://www.gis4everyone.com/WUSMUC)

### AGIC QUARTERLY BOARD MEETING

FEBRUARY 7, 2008

10:00 AM

ADOT HUMAN RESOURCES DEVELOPMENT CENTER

1130 N 22ND AVE, PHOENIX

[HTTP://AGIC.AZ.GOV/BOARD/MEETINGS.HTM](http://AGIC.AZ.GOV/BOARD/MEETINGS.HTM)

### INTERNET MAPPING USER GROUP MEETING

APRIL 3, 2008

1:00-4:00 PM

DEPARTMENT OF ADMINISTRATION BUILDING

100 N. 15<sup>TH</sup> AVE., ROOM 300, PHOENIX

CONTACT: SHEA LEMAR, [SHEA.LEMAR@ASU.EDU](mailto:SHEA.LEMAR@ASU.EDU)

## Further Information – TOPOFF 4

### TOPOFF Exercise Series Fact Sheet

[http://www.dhs.gov/xprepresp/training/gc\\_1192227908698.shtm](http://www.dhs.gov/xprepresp/training/gc_1192227908698.shtm)

### TOPOFF 4 Fact Sheet

[http://www.dhs.gov/xprepresp/training/gc\\_1179350946764.shtm](http://www.dhs.gov/xprepresp/training/gc_1179350946764.shtm)

### TOPOFF 4 Fact Sheet - Arizona

[http://www.dhs.gov/xprepresp/training/gc\\_1192223430774.shtm](http://www.dhs.gov/xprepresp/training/gc_1192223430774.shtm)

### TOPOFF 4 Frequently Asked Questions

[http://www.dhs.gov/xprepresp/training/gc\\_1179422026237.shtm](http://www.dhs.gov/xprepresp/training/gc_1179422026237.shtm)